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UNITED STATES PUBLIC HEALTH SERVICE
RUPERT BLUE, SURGEON GENERAL

MENTAL STATUS OF RURAL SCHOOL CHILDREN

REPORT OF PRELIMINARY SANITARY SURVEY MADE IN NEW CASTLE COUNTY, DELAWARE, WITH A DESCRIPTION OF THE TESTS EMPLOYED

BY

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United States Public Health Service

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WITH

THE MENTAL STATUS OF RURAL SCHOOL CHILDREN OF PORTER COUNTY, INDIANA

BY

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United States Public Health Service

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MENTAL STATUS OF RURAL SCHOOL CHILDREN.

REPORT OF PRELIMINARY SANITARY SURVEY MADE IN NEW CASTLE COUNTY, DELAWARE, WITH A DESCRIPTION OF THE TESTS EMPLOYED.[1]

By E. H. Mullan, Passed Assistant Surgeon, United States Public Health Service.

At the request of the Delaware State board of health, State board of education, and Cooperative Educational Association, the United States Public Health Service undertook a sanitary survey of the rural schools of New Castle County, including the mental status of the school children. This survey is part of a series of cooperative investigations of educational, health, and sociological conditions in the State of Delaware by the Public Health Service, the National Bureau of Education, the Children's Bureau, and other agencies. In order to supply certain data desired by the Children's Bureau in their investigations, the mental survey herein reported was conducted preliminary to the general survey. It continued from January 6 to May 1, 1916.

During this investigation 3,793 children were studied. Of these, 19, or 0.5 per cent of the total, were found to be definitely feebleminded and in need of careful supervision or institutional treatment. In addition, 50 other children, or 1.3 per cent of the total number examined, exhibited abnormal mental symptoms to such an extent as to be considered probable mental defectives.

At the beginning of this survey a majority of the school children were tested by the Binet-Simon scale, and those who showed symptoms of mental abnormality were examined by supplemental methods. The routine giving of the Binet tests to every pupil was soon replaced by a briefer sifting process for the purpose of finding those children of low intelligence or those in whom mental peculiarities existed. This brief examination was composed of questions and tests suited in a general way to the child's age and school grade.

If, during this preliminary examination or sifting process, symptoms arose which suggested mental abnormality, the case was examined more thoroughly. At this secondary examination every effort was made to arrive at a correct diagnosis in so far as one sitting would permit, and each suspected pupil was given Goddard's modification of the Binet tests, together with other tests and questions. This reexamination lasted from 20 to 50 minutes.

In the city [2] and town schools which were graded or partially graded, the children were questioned one at a time in the principal's office or other room. In practically all of the rural schools, however,

[1] Reprint from the Public Health Reports, vol. 31, No. 46, Nov. 17, 1916, pp. 3174-3187.

[2] In the city of New Castle approximately 225 children were given the Binet-Simon examination.

the examination was conducted in the schoolroom in the presence of the teacher and pupils. When the weather became warm all the children were sent to the playground with the exception of those belonging to one grade, each grade being called in separately for examination. During the testing the teacher was instructed to give those present various tasks which could be quietly performed at their desks. Recitations were forbidden during the examinations, as noise of any kind interfered with the testing, and especially with that form of testing known as the repetition of digits.

BINET-SIMON EXAMINATIONS.

Manner of giving tests.—In making a Binet examination each child was permitted to try every test whenever there was a possibility of his performing it.

Every pupil over 7 years of age was tested with the IX-year series of tests, because normal and abnormal pupils are met with who can qualify in all of the X-year tests and yet fail on one or more tests of the IX-year group. No Binet tests higher than the XII-year series were used, since tests devised for higher age groups have not proved reliable.[1]

Result.—The results of the Binet-Simon examination of 209 normal children, 174 white and 35 colored, in the city of New Castle, are presented in the subjoined table:

TABLE I.—*Binet ages of 209 normal children (174 white, 34 colored) in the city of New Castle.*

Chronological age.	Mental age.																																			Number of children.
	12	11.8	11.6	11.4	11.2	11	10.8	10.6	10.4	10.2	10	9.8	9.6	9.4	9.2	9	8.8	8.6	8.4	8.2	8	7.8	7.6	7.4	7.2	7	6.8	6.6	6.4	6.2	6	5.8	5.6	5.4	5.2	5	
15	..	..	..	..	..	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
14.5	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
14	..	..	..	1	..	2	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
13.5	..	..	2	1	1	..	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
13	..	..	..	1	1	2	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
12.5	..	..	..	..	1	1	1	3	2	1	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
12	..	..	..	2	1	1	1	3	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
11.5	..	1	1	..	1	4	1	..	1	1	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
11	..	..	1	..	1	2	2	2	2	..	5	1	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18
10.5	..	..	..	2	1	..	3	1	1	2	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
10	..	..	..	..	..	..	1	..	1	1	5	..	1	1	3	1	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
9.5	..	..	..	..	..	..	1	2	3	1	2	..	1	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
9	..	..	..	..	..	..	2	..	..	..	1	1	..	1	3	3	2	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
8.5	..	..	..	..	..	..	..	1	..	3	1	..	2	..	5	1	1	1	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	17
8	..	..	..	..	..	..	..	..	..	..	2	1	2	1	3	4	..	2	2	1	1	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	21
7.5	..	..	..	..	..	..	..	..	..	..	..	1	2	3	..	1	1	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
7	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2	2	..	1	..	2	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	11
6.5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	2	..	1	..	2	3	1	1	..	1	..	..	..	..	..	..	1	14
Total	1	1	4	7	8	12	16	14	13	11	16	10	6	9	16	13	11	6	6	6	3	4	3	1	2	4	2	1	1	1	0	0	0	0	0	1	209

[1] In the IX-year group of tests the subtraction of 4 from 20 abstractly was used instead of the actual counting out of change.

In the XI-year series, the giving of 20 words in 30 seconds was considered the equivalent of giving 60 words in 3 minutes. This consideration was based on some previous experimental work.

The dissected sentences of the XI-year series, according to Goddard's correction of April, 1913, were used.

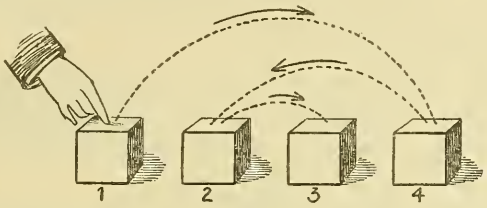
In the "Resisting suggestion" test of the XII-year group, two correct judgments out of the last three judgments were scored as a satisfactory reply.

Although 209 Binet examinations are a small number, this table shows the wide variation which exists in the Binet ages of children who are not considered defective.

SIFTING PROCESS.

On January 27 the sifting process replaced the routine Binet examination, beginning with the seventh grade of the New Castle School. The sifting method, and reexamining when necessary by the Binet and other methods, was continued throughout the survey.

The weeding out process was instituted simply to bring out the child's mentation in order that subnormal or abnormal suspects could be separated from the average children. It is believed that almost any simple test or series of simple tests could be used for this purpose. After due consideration, the cube test, the repetition of digits, and problem were selected. These three tests, occupying



about four or five minutes, were thenceforth used in the examination of every child.

Cube Test.

The cube test, which has proved its usefulness in the mental examination of arriving immigrants, was the first test given to each child. This test consists in the touching of four or five cubes by the examiner in a definite order, immediately after which the subject strives to imitate the examiner, touching the same cubes in the same order.

In the diagram four cubes are represented. They are on a table immediately in front of the subject. The movement here depicted shows that the examiner is touching cube 1 with his finger, after which he immediately touches cube 4, then after a slight pause (one-half to two seconds) he touches cube 2, and immediately afterwards cube 3. The subject then imitates the examiner. The examiner next touches the four blocks in a different order, which operation in turn is executed by the subject.

The following six movements were selected for the four-cube test, the numbers indicating the different cubes:

First	1	4	2	3	Fourth	4	2	3	1
Second	1	3	4	2	Fifth	3	2	4	1
Third	1	3	2	4	Sixth	2	4	1	3

The execution of these six movements on the part of the examiner and the repetition of them by the subject ordinarily requires from 40 to 60 seconds. Two trials were allowed only for the first movement.

The following four movements were used in the five-cube test. The longer spaces between the digits indicate a time interval of from one and one-half to two seconds; in other words, a distinct pause occurred midway in the movement.

First.....	1	4	5		2	3	Third.....	5	1	3	4	2
Second.....	2	4	1		3	5	Fourth.....	4	3	5	2	1

In giving the cube test, a sufficient time mentally to recover was allowed after each movement. The weighted cubes used in the weight-discrimination test were used for this test.

During the cube test the subject was carefully observed. His general get-up, facial expression, amount of self-reliance, power of comprehension, muscular control, rapidity of movement, attention over a period of 45 seconds, emotional state, and accuracy of performance were all noticed.

The fourth movement of the four-cube test brought out the subject's power to resist suggestion, and the different movements of the five-cube test permitted analytic processes to take place. Good vision is essential for the performance of this test.

The five-cube test was used in the sixth, seventh, and eighth grades. Children of the lower grades were examined with the four-cube test.

Most of the children in the upper grades succeeded in performing two movements out of the four movements with the five-cube test, this being considered satisfactory. Whenever a subject succeeded in all four movements with the five-cube test his general examination record was usually excellent.

Ability to succeed in at least four movements out of the six movements with the four-cube test was considered a satisfactory performance. Satisfactory performances with this test are not accomplished until the child reaches the age of eight. This is proven by the tables inserted below. These show how 1,393 white children between the ages of 6 and 10 in the rural schools of New Castle County performed the four-cube test.

TABLE II.—*Four-cube test.*

Record of 1,393 white children in New Castle County, Del.

178 children, age 6.

14 children accomplished 6 movements 20 children accomplished 5 movements 30 children accomplished 4 movements	64 children, or 36 per cent, succeeded in 4 movements.
28 children accomplished 3 movements 35 children accomplished 2 movements 19 children accomplished 1 movement. 32 children accomplished 0 movement.	114 children.

TABLE II.—*Four-cube test*—Continued.

135 children, age 7.

14 children accomplished 6 movements	85 children, or 63 per cent, succeeded in 4 movements.
36 children accomplished 5 movements	
35 children accomplished 4 movements	
16 children accomplished 3 movements	50 children.
14 children accomplished 2 movements	
12 children accomplished 1 movement.	
8 children accomplished 0 movement.	

147 children, age 7½.

23 children accomplished 6 movements	104 children, or 71 per cent, succeeded in 4 movements.
48 children accomplished 5 movements	
33 children accomplished 4 movements	
17 children accomplished 3 movements	43 children.
19 children accomplished 2 movements	
5 children accomplished 1 movement.	
2 children accomplished 0 movement.	

174 children, age 8.

40 children accomplished 6 movements	133 children, or 76 per cent, succeeded in 4 movements.
49 children accomplished 5 movements	
44 children accomplished 4 movements	
24 children accomplished 3 movements	41 children.
7 children accomplished 2 movements	
5 children accomplished 1 movement.	
5 children accomplished 0 movement.	

192 children, age 8½.

55 children accomplished 6 movements	150 children, or 78 per cent, succeeded in 4 movements.
52 children accomplished 5 movements	
43 children accomplished 4 movements	
31 children accomplished 3 movements	42 children.
9 children accomplished 2 movements	
1 child accomplished 1 movement....	
1 child accomplished 0 movement....	

170 children, age 9.

61 children accomplished 6 movements	131 children, or 77 per cent, succeeded in 4 movements.
47 children accomplished 5 movements	
23 children accomplished 4 movements	
23 children accomplished 3 movements	39 children.
12 children accomplished 2 movements	
4 children accomplished 0 movement.	

230 children, age 9½.

92 children accomplished 6 movements	211 children, or 92 per cent, succeeded in 4 movements.
77 children accomplished 5 movements	
42 children accomplished 4 movements	
13 children accomplished 3 movements	19 children.
5 children accomplished 2 movements	
1 child accomplished 0 movement....	

167 children, age 10.

51 children accomplished 6 movements	138 children, or 83 per cent, succeeded in 4 movements.
56 children accomplished 5 movements	
31 children accomplished 4 movements	
20 children accomplished 3 movements	29 children.
4 children accomplished 2 movements	
1 child accomplished 1 movement....	
4 children accomplished 0 movement.	

Repetition of Digits.

The repetition of digits followed the cube test. In giving this test the examiner gave the digits rather rapidly, allowing a small interval of time to occur midway in the enunciation of the digits. This small interval of time, less than a second, may be represented by a space in the following series: 179 286; 1395 847; 4792 3815. The tone of the examiner's voice in propounding this test may be characterized by the term "musical." The usual enunciation in monotone of each digit, recommended in textbooks on psychology, was not used.

With one exception, two trials were given for the repetition of each series of digits; that is, the subject was given two trials to repeat six digits, two trials to repeat eight digits, and so on, a different series of numbers being used. The exception above referred to is as follows: When a subject had reached the age of 12 he was given seven or eight trials, if necessary, to repeat seven digits. The time spacings between the different digits were varied at each trial. These variations may be thus represented: 179 2864; 1495 387; 59 17 28 4.

If a child of 12 or over was unable to repeat seven digits after several trials, the examiner would say to him:

Just listen. Do not say these numbers to yourself. Say them quickly to me as soon as I finish.

This is a test in sound. If you stop to think of these numbers you will lose them. Just say them quickly to me.

Every effort was made to get the child of 12 years and above to repeat seven digits. It was found that among the children examined the failure of those of 12 and over to repeat seven digits was a symptom in many instances of mental deficiency. As a rule, it was found that children thus failing made a poor showing in many of the other mental tests. A number of mentally defective persons who were able to repeat six digits at first soon tired in their effort to repeat seven, became inattentive, and later were unable even to repeat six.

The following tables show the digit repeating ability or memory span of 3,488 children examined in New Castle County. One girl, age 14, repeated 13 digits. No other pupil was able to repeat 12 digits. Seven children, six girls and one boy, repeated 11 digits. These were the best records made during this test. The colored children did relatively better work in repeating digits than they did in the other sifting tests. These tables show that children between the ages of 7 and 11 can repeat six digits.

TABLE III.—*Repetition of digits.*

White children of New Castle County, Del.; 1,612 boys examined; 1,429 girls examined.

73 boys, age 15 and above.	Digits.	*79 girls, age 15 and above.*	Digits.
1 boy repeated	10	1 girl repeated	10
8 boys repeated	9	7 girls repeated	9
23 boys repeated	8	23 girls repeated	8
22 boys repeated	7	31 girls repeated	7
16 boys repeated	6	15 girls repeated	6
2 boys repeated	5	1 girl repeated	5
1 boy repeated	4	1 girl repeated	4
58 boys, age 14½.		*56 girls, age 14½.*	
1 boy repeated	10	5 girls repeated	10
6 boys repeated	9	8 girls repeated	9
20 boys repeated	8	11 girls repeated	8
22 boys repeated	7	25 girls repeated	7
8 boys repeated	6	6 girls repeated	6
1 boy repeated	5	1 girl repeated	4

TABLE III.—*Repetition of digits*—Continued.

White children of New Castle County, Del.; 1,612 boys examined: 1,429 girls examined—Continued.

74 boys, age 14.

1 boy repeated	11
4 boys repeated	9
28 boys repeated	8
28 boys repeated	7
11 boys repeated	6
1 boy repeated	5
1 boy repeated	4

59 girls, age 14.

1 girl repeated	13
3 girls repeated	10
7 girls repeated	9
15 girls repeated	8
22 girls repeated	7
9 girls repeated	6
2 girls repeated	5

92 boys, age 13½.

4 boys repeated	10
10 boys repeated	9
29 boys repeated	8
38 boys repeated	7
11 boys repeated	6

95 girls, age 13½.

2 girls repeated	11
5 girls repeated	10
7 girls repeated	9
31 girls repeated	8
32 girls repeated	7
17 girls repeated	6
1 girl repeated	5

98 boys, age 13.

4 boys repeated	10
10 boys repeated	9
24 boys repeated	8
38 boys repeated	7
21 boys repeated	6
1 boy repeated	5

91 girls, age 13.

1 girl repeated	11
3 girls repeated	10
9 girls repeated	9
29 girls repeated	8
35 girls repeated	7
10 girls repeated	6
4 girls repeated	5

101 boys, age 12½.

6 boys repeated	9
34 boys repeated	8
44 boys repeated	7
17 boys repeated	6

76 girls, age 12½.

1 girl repeated	10
4 girls repeated	9
25 girls repeated	8
32 girls repeated	7
12 girls repeated	6
2 girls repeated	5

89 boys, age 12.

1 boy repeated	10
6 boys repeated	9
19 boys repeated	8
46 boys repeated	7
16 boys repeated	6
1 boy repeated	4

86 girls, age 12.

1 girl repeated	11
8 girls repeated	9
24 girls repeated	8
28 girls repeated	7
21 girls repeated	6
3 girls repeated	5
1 girl repeated	4

83 boys, age 11½.

4 boys repeated	10
8 boys repeated	9
11 boys repeated	8
36 boys repeated	7
21 boys repeated	6
3 boys repeated	5

91 girls, age 11½.

1 girl repeated	11
2 girls repeated	10
5 girls repeated	9
16 girls repeated	8
29 girls repeated	7
33 girls repeated	6
4 girls repeated	5
1 girl repeated	4

81 boys, age 11.

6 boys repeated	9
18 boys repeated	8
31 boys repeated	7
24 boys repeated	6
2 boys repeated	5

82 girls, age 11.

3 girls repeated	10
2 girls repeated	9
18 girls repeated	8
34 girls repeated	7
24 girls repeated	6
1 girl repeated	5

109 boys, age 10½.

1 boy repeated	10
5 boys repeated	9
17 boys repeated	8
47 boys repeated	7
35 boys repeated	6
2 boys repeated	5
2 boys repeated	4

77 girls, age 10½.

2 girls repeated	10
3 girls repeated	9
11 girls repeated	8
30 girls repeated	7
28 girls repeated	6
3 girls repeated	5

89 boys, age 10.

1 boy repeated	9
9 boys repeated	8
33 boys repeated	7
42 boys repeated	6
2 boys repeated	5
2 boys repeated	4

79 girls, age 10.

2 girls repeated	10
3 girls repeated	9
18 girls repeated	8
29 girls repeated	7
23 girls repeated	6
4 girls repeated	5

131 boys, age 9½.

2 boys repeated	9
16 boys repeated	8
50 boys repeated	7
54 boys repeated	6
8 boys repeated	5
1 boy repeated	4

101 girls, age 9½.

3 girls repeated	9
15 girls repeated	8
36 girls repeated	7
42 girls repeated	6
5 girls repeated	5

TABLE III.—*Repetition of digits*—Continued.

White children of New Castle County, Del.; 1,612 boys examined; 1,429 girls examined—Continued.

89 boys, age 9.

1 boy repeated	10
5 boys repeated	8
30 boys repeated	7
44 boys repeated	6
9 boys repeated	5

78 girls, age 9.

2 girls repeated	9
12 girls repeated	8
23 girls repeated	7
37 girls repeated	6
2 girls repeated	5
2 girls repeated	4

101 boys, age 8½.

1 boy repeated	10
2 boys repeated	9
10 boys repeated	8
38 boys repeated	7
35 boys repeated	6
13 boys repeated	5
2 boys repeated	4

88 girls, age 8½.

1 girl repeated	10
2 girls repeated	9
7 girls repeated	8
29 girls repeated	7
37 girls repeated	6
10 girls repeated	5
2 girls repeated	4

97 boys, age 8.

2 boys repeated	9
5 boys repeated	8
27 boys repeated	7
46 boys repeated	6
14 boys repeated	5
3 boys repeated	4

71 girls, age 8.

6 girls repeated	8
15 girls repeated	7
42 girls repeated	6
7 girls repeated	5
1 girl repeated	4

69 boys, age 7½.

1 boy repeated	9
1 boy repeated	8
16 boys repeated	7
41 boys repeated	6
7 boys repeated	5
3 boys repeated	4

82 girls, age 7½.

2 girls repeated	10
6 girls repeated	8
17 girls repeated	7
45 girls repeated	6
11 girls repeated	5
1 girl repeated	4

69 boys, age 7.

2 boys repeated	8
11 boys repeated	7
41 boys repeated	6
12 boys repeated	5
2 boys repeated	4
1 boy repeated	3

66 girls, age 7.

1 girl repeated	9
2 girls repeated	8
18 girls repeated	7
36 girls repeated	6
8 girls repeated	5
1 girl repeated	4

100 boys, age 6.

1 boy repeated	9
11 boys repeated	7
43 boys repeated	6
35 boys repeated	5
17 boys repeated	4
1 boy repeated	3
1 boy repeated	2

72 girls, age 6.

1 girl repeated	8
10 girls repeated	7
28 girls repeated	6
21 girls repeated	5
11 girls repeated	4
1 girl repeated	3

Colored children of New Castle County, Del.; 202 boys; 245 girls.

21 boys, age 15 and above.

	Digits.
1 boy repeated	10
2 boys repeated	9
6 boys repeated	8
9 boys repeated	7
3 boys repeated	6

21 girls, age 15 and above.

	Digits.
1 girl repeated	9
8 girls repeated	8
8 girls repeated	7
4 girls repeated	6

12 boys, age 14½.

1 boy repeated	10
2 boys repeated	9
3 boys repeated	8
6 boys repeated	7

9 girls, age 14½.

3 girls repeated	9
2 girls repeated	8
3 girls repeated	7
1 girl repeated	6

6 boys, age 14.

3 boys repeated	8
3 boys repeated	7

7 girls, age 14.

1 girl repeated	8
3 girls repeated	7
3 girls repeated	6

11 boys, age 13½.

3 boys repeated	8
5 boys repeated	7
3 boys repeated	6

12 girls, age 13½.

5 girls repeated	8
4 girls repeated	7
3 girls repeated	6

5 boys, age 13.

2 boys repeated	8
1 boy repeated	7
1 boy repeated	6
1 boy repeated	5

9 girls, age 13.

1 girl repeated	9
4 girls repeated	8
3 girls repeated	7
1 girl repeated	6

TABLE III.—*Repetition of digits*—Continued.

Colored children of New Castle County, Del.; 202 boys: 245 girls—Continued.

11 boys, age 12½.	
5 boys repeated	8
2 boys repeated	7
3 boys repeated	6
1 boy repeated	5
14 boys, age 12.	
1 boy repeated	10
5 boys repeated	8
3 boys repeated	7
4 boys repeated	6
1 boy repeated	5
15 boys, age 11½.	
4 boys repeated	8
9 boys repeated	7
1 boy repeated	6
1 boy repeated	4
10 boys, age 11.	
1 boy repeated	10
1 boy repeated	9
6 boys repeated	7
2 boys repeated	6
14 boys, age 10½.	
4 boys repeated	8
4 boys repeated	7
6 boys repeated	6
9 boys, age 10.	
1 boy repeated	8
1 boy repeated	7
6 boys repeated	6
1 boy repeated	5
15 boys, age 9½.	
2 boys repeated	8
8 boys repeated	7
5 boys repeated	6
5 boys, age 9.	
1 boy repeated	8
2 boys repeated	7
2 boys repeated	6
10 boys, age 8½.	
2 boys repeated	8
7 boys repeated	6
1 boy repeated	5
9 boys, age 8.	
3 boys repeated	7
4 boys repeated	6
2 boys repeated	5
12 boys, age 7½.	
1 boy repeated	8
4 boys repeated	7
3 boys repeated	6
4 boys repeated	5
15 boys, age 7.	
1 boy repeated	8
1 boy repeated	7
10 boys repeated	6
3 boys repeated	5
8 boys, age 6.	
8 boys repeated	6

13 girls, age 12½.	
2 girls repeated	8
6 girls repeated	7
5 girls repeated	6
22 girls, age 12.	
1 girl repeated	11
2 girls repeated	9
4 girls repeated	8
7 girls repeated	7
8 girls repeated	6
20 girls, age 11½.	
2 girls repeated	9
4 girls repeated	8
7 girls repeated	7
6 girls repeated	6
1 girl repeated	5
15 girls, age 11.	
4 girls repeated	8
7 girls repeated	7
2 girls repeated	6
1 girl repeated	5
1 girl repeated	4
17 girls, age 10½.	
3 girls repeated	8
10 girls repeated	7
4 girls repeated	6
12 girls, age 10.	
1 girl repeated	9
2 girls repeated	8
3 girls repeated	7
6 girls repeated	6
12 girls, age 9½.	
2 girls repeated	8
6 girls repeated	7
4 girls repeated	6
17 girls, age 9.	
1 girl repeated	9
5 girls repeated	7
9 girls repeated	6
2 girls repeated	5
9 girls, age 8½.	
1 girl repeated	8
4 girls repeated	7
4 girls repeated	6
16 girls, age 8.	
7 girls repeated	7
8 girls repeated	6
1 girl repeated	5
6 girls, age 7½.	
2 girls repeated	7
3 girls repeated	6
1 girl repeated	5
15 girls, age 7.	
1 girl repeated	9
1 girl repeated	8
3 girls repeated	7
9 girls repeated	6
1 girl repeated	5
13 girls, age 6.	
4 girls repeated	7
6 girls repeated	6
2 girls repeated	5
1 girl repeated	3

Problems.

During the sifting process, the examiner propounded a problem in mental arithmetic to each child. Two trials were allowed.

Children of the sixth, seventh, and eighth grades were given the same kind of problems (each child being given the 30-cent problem, the three-fourths problem, and the two-fifths problem). When the child failed in the three-fourths problem, however, the last one was not given. These problems were as follows:

Thirty-cent problem: "If you have 30 cents and go to the post office and buy two 2-cent stamps, two 1-cent stamps, and two postal cards, how much money will you have left?" Or, "If you have 30 cents and go to the post office and buy three 2-cent stamps, three 1-cent stamps, and three postal cards, how much money will you have left?"

These problems may be thus expressed:

30 cents−(2 2's+2 1's+2 p's)=?
30 cents−(3 2's+3 1's+3 p's)=?
30 cents−(4 2's+4 1's+4 p's)=?
30 cents−(5 2's+5 1's+5 p's)=?
30 cents−(6 2's+6 1's+6 p's)=?

Three-fourths problem: "If three-fourths of a farm cost $600, what will the whole farm cost?" Or, "If three-fourths of a farm cost $1,200, what will the whole farm cost?" and so on.

Two-fifths problem: "If two-fifths of a farm cost $800, what will one-half of the same farm cost?" "If two-fifths of a farm cost $1,200, what will one-half of the same farm cost?" "If two-fifths of a farm cost $2,400, what will one-half of the same farm cost?"

In the fifth grade, the fraction problems were not used, the 30-cent problem alone being given. In the fourth grade the 20-cent problem was used:

Twenty-cent problem: "If you have 20 cents, and go to the post office and buy two 2-cent stamps and two 1-cent stamps, how much money will you have left?"

These problems may be thus represented:

20 cents−(2 1's+2 2's)=?
20 cents−(3 1's+3 2's)=?
20 cents−(4 1's+4 2's)=?
20 cents−(5 1's+5 2's)=?
20 cents−(6 1's+6 2's)=?

In the third grade the 20-cent problem was given in a simpler form:

Twenty-cent problem (third grade): "If you have 20 cents and spend 2 cents for bread and 2 cents for butter, how much money will you have left?" In each case the base number, 20, was retained, thus:

20 cents−(2+2)=?
20 cents−(3+3)=?
20 cents−(4+4)=?
20 cents−(6+6)=?

In the second grade the 10-cent problem was used:

10−(1+1)=?
10−(2+4)=?
10−(3+3)=?
10−(5+2)=?
10−(5+3)=?
10−(1+5)=?

The children in the first grade were given the finger problem:

Finger problem: "I have five fingers (the examiner holding up his left hand and showing the five fingers); and if I take a knife and cut off these two fingers, how many fingers will be left on that hand?" Variations may be thus represented:

5−2=?
5−1=?
5−3=?, etc.

These problems throw light on the reasoning and learning ability of the children, as well as upon the quality of teaching they have received.

The sifting process, or examination by means of the cube test, memory span, and problem, was given to all the children of New Castle County, with the exception of about 215 in the schools of the city of New Castle.

SECONDARY EXAMINATION.

Nature.

If at the primary examination symptoms of mental abnormality occurred, the case was gone into more thoroughly. At the reexamination a Binet examination was made which occupied 20 minutes. Some other tests and questions were also propounded as the examiner deemed necessary. Some of these were:

Reading.
Spelling.
Questions on general information suited to the subject's environment.
Cube test.

Days of the week backward.
Months backward.
Spelling backward.
Counting backward.
Interpretation of pictures upside down.
Arithmetic { Addition series. / Problems.
Counting money.
Telling time.

The subject was further tested by teaching him arithmetical processes step by step, grounding him first in concrete relationships and afterwards in abstractions. His ability to see into, catch on, retain, and improve was carefully observed. This testing was planned to throw light upon the subject's attention, memory, learning power, reasoning ability, and emotional state. In many cases considerable information in regard to his intelligence and emotional state was obtained in this way. In addition to the above tests, questions were put to the subject as thought feasible, in order to bring to light the whys and wherefores regarding his attitudes, interests, habits, emotional states, and health. His ordinary judgment or common sense was always inquired into. A physical examination was made

when necessary, special attention being directed to the vision, hearing, and neurological side.

Brothers and sisters of the suspect as well as his teacher and principal were questioned. This was done in order to find data which would bear upon the past medical history, school history, and family history of the suspect.

In addition, the character of the teaching which the child had received, together with the general tenor of the class or school, was considered.

The age, sex, and especially the race of the child was constantly kept in mind.

Results.

As a result of this survey a group of 19 mentally defective children are presented. These cases are distinctive and positive. There are also 50 cases to which the term "suspicions of mental deficiency" is applied. Eight epileptics were found during the survey. Finally, there is a group of peculiar children which may be designated as the psychopathic group. No attempt was made to study this group minutely.

TABLE IV.—*Abnormal children I.*

19 MENTAL DEFECTIVES.

Case.	Race.	Sex.	Age.	Grade.	Binet age.
1	Colored	Male	18 years	Ungraded.	7.2
2	do	Female	17 years, 8 months	I	6.2
3	White	do	16 years, 8 months	V and VI	8.6
4	do	do	15 years, 8 months	III	.....
5	do	do	14 years, 6 months	I	5.8
6	do	Male	14 years, 2 months	I	7.4
7	do	Female	14 years	VII	7.2
8	do	Male	13 years, 7 months	IV	9.8
9	do	do	13 years	IV	.....
10	do	Female	12 years, 11 months	II	7.2
11	do	Male	12 years, 5 months	II	9.4
12	do	Female	11 years, 6 months	.....	8
13	do	Male	11 years, 1 month	Ungraded.	3
14	do	do	10 years, 5 months	I	3.2
15	do	do	10 years	I	6.4
16	do	do	9 years	I	4.6
17	Colored	do	do	Ungraded.	4
18	White	Female	do	I	5
19	Colored	do	8 years, 11 months	I	5

50 MENTAL DEFECTIVES (SUSPICIOUS).

20	Colored	Male	16 years, 10 months	I	7.2
21	White	Female	16 years, 11 months	VI	10.6
22	do	Male	16 years, 1 month	VI	11
23	do	do	15 years, 7 months	V	11.2
24	do	do	15 years, 4 months	VI	9.4
25	do	do	15 years	V	.....
26	do	Female	14 years, 7 months	V and VI	.....
27	do	Male	14 years	VII	10.2
28	do	Female	do	V	9.8
29	do	do	13 years, 11 months	IV	9.6
30	Colored	Male	13 years, 10 months	IV	8.8
31	White	do	13 years, 9 months	V	10.2
32	do	Female	13 years, 7 months	V	10.4
33	do	Male	do	IV	9.2
34	do	Female	13 years, 6 months	IV	9.4
35	do	do	13 years, ½ month	IV	9.6
36	do	Male	13 years	III	10.6
37	do	Female	12 years, 11 months	III	8.6
38	do	Male	12 years, 10 months	I	7.6

TABLE IV.—*Abnormal children I*—Continued.

50 MENTAL DEFECTIVES (SUSPICIOUS)—Continued.

Case.	Race.	Sex.	Age.	Grade.	Binet age.
39	White	Male	12 years, 6 months	IV	8.4
40	Colored	do	do	I	7
41	White	do	12 years, 5 months	IV	10
42	do	do	12 years, 4 months	VI	11.4
43	Colored	Female	12 years, 3 months		8.8
44	do	Male	12 years, 2 months	I	8.6
45	White	do	12 years, 1½ months	III	8.6
46	Colored	Female	12 years	I	7.8
47	do	do	do	II	9.8
48	do	do	11 years	I and IV	8.8
49	White	do	do	II	8
50	do	Male	10 years, 5 months	I	6.6
51	do	do	do	I	7.4
52	do	Female	do	II	8.8
53	do	Male	10 years	I	6.4
54	do	Female	do	I	7.2
55	do	do	9 years, 9 months		8.2
56	do	do	do	I	7.4
57	Colored	Male	9 years, 7½ months	I	7.8
58	White	do	9 years, 6 months	I	7.2
59	do	do	9 years	II	6.8
60	do	do	do	II	
61	do	do	do	II	6.3
62	Colored	Female	do	I	7.2
63	White	Male	8 years, 7 months	I	5.8
64	do	do	8 years, 3 months	I	6.4
65	do	do	7 years, 10 months	I	4
66	do	Female	7 years, 6 months	P	4.4
67	Colored	do	7 years, 2 months	I	4.4
68	White	do	6 years, 5 months	P	4.2
69	do	Male	6 years	I	4.6

8. EPILEPTICS.

70	Colored	Male	18 years, 7 months	VI	11.0
71	White	do	14 years, 6 months	V	10.6
72	do	Female	14 years, 2 months	III	9.6
73	do	Male	13 years, 11½ months	VIII	11.2
74	do	do	12 years, 6 months	VI	11
75	do	do	11 years	II	8.8
76	Colored	do	10 years	I, II, III	7.4
77	do	Female	7 years, 5 months	I	7.2

9. SUBNORMAL CHILDREN WHO GIVE A HISTORY OF ATTACKS OF UNCONSCIOUSNESS.

78	White	Male	16 years, 6 months	V	9.4
79	do	do	15 years, 3 months	VI	11.2
80	do	do	13 years, 11 months	VI	11
81	Colored	do	13 years, 6 months	V	10.2
82	White	do	12 years, 6 months	IV	9.6
83	do	Female	11 years, 3½ months	IV	9.2
84	do	do	10 years, 6 months	III	9.2
85	do	do	9 years, 8 months		7.4
86	do	Male	6 years	I	5.6

PECULIAR CHILDREN.

87	White	Male	14 years, 10 months	VII	11.8
88	do	do	14 years	IV	10.4
89	do	do	13 years	IV	
90	do	Female	12 years, 8 months		
91	do	do	12 years, 6 months	III	10.2
92	do	do	do	IV	11
93	do	do	12 years, 4 months	VI	9.8
94	do	do	12 years	V	10.4
95	do	do	11 years, 10 months	IV	8.4
96	do	do	11 years, 2 months	III	9.2
97	do	Male	9 years	III	8
98	do	do	7 years, 11 months	I	8
99	do	do	7 years	1	8

CONCLUSIONS AND RECOMMENDATIONS.

1. Mental deficiency can not be diagnosed by means of the Binet scale alone. This is shown in Tables I and IV, where it may be observed that some children who measure 9 and 10 years by the Binet scale are considered normal, while other children of the same chronological age, who measure 10 and 11 years mentally by the Binet scale, are considered mentally defective.[1]

2. The Binet tests are an excellent means for finding out the various mental abilities of an individual. During the application of these tests much light is thrown upon the subject's general fund of information, and an opportunity is afforded to observe the quickness and the character of mental operations, emotional states, and abnormal mental symptoms.

3. The employment of selected tests is a rapid and effective method of differentiating subnormal children in schools for purpose of diagnosis.

4. Normal children 8 years of age and over should perform four movements out of six movements with the four-cube test.

5. Normal white children 12 years of age and over should perform two out of four movements with the five-cube test.

6. Normal children between the ages of 7 and 11 years should be able to repeat six digits.

7. Five-tenths of 1 per cent of 3,793 rural school children examined in New Castle County are definitely feeble-minded and in need of institutional treatment.

8. An additional 1.3 per cent of the total number were so retarded mentally as to be considered probable mental defectives and in need of institutional care.

9. A number of mentally defective children were encountered who exhibited symptoms similar to those which are observed in the adult insane.

10. It is believed, as a result of this survey, that epilepsy is a more prevalent disease than it has heretofore been thought to be.

11. The defective school children encountered in the schools of New Castle County hamper school work just as in other places. In some instances they are a real source of danger to other pupils, and many of them are in school because there is no place to put them.

12. It can not be too strongly recommended that the State of Delaware provide a home for the feeble-minded and other defective individuals who are without proper guardianship where they may be segregated and taught under proper supervision to be self-supporting.

13. It is furthermore strongly recommended that proper measures be taken for the formation of special classes to supply needful training to retarded children in the schools of the State.

[1] The writer personally believes that the term Binet-score should be substituted for the term Binet-age and that "12 points," instead of Binet-age of 12, should be considered the maximum score.

THE MENTAL STATUS OF RURAL SCHOOL CHILDREN OF PORTER COUNTY, IND.[1]

In the course of this survey, a study was made of the mental condition of each child. The purpose was not only to determine the number of mental defectives which require special or individual treatment, but to study the influence of school surroundings on mental status. Coincidently, studies were made to determine the value of the Binet-Simon tests for grading intelligence.

A total of 2,185 children was thus examined, special reliance being placed in the Binet tests with some modifications. In the case of exceptionally retarded children revealed by these tests, however, special methods were employed to determine the degree of mental impairment.

HISTORY OF THE TESTS.

As is known, Binet and Simon, on data collected during the examination of 200 normal French school children, devised a series of tests for different age periods. As originally devised, the number of tests for each age group varied from four to seven. In 1911 the tests were revised, and the number for each age group was fixed at five, except that of the four-year group, which contains four tests. This revision was based on the examination of 203 French school children. Of this number, the observers gave tabular results for 192, as follows:

TABLE XI.—*Mental and chronological ages of 192 French school children examined by Binet and Simon.*[2]

Chronological age.	3	4	5	6	7	8	9	10	11	12	Total.
Regular	3	9	13	5	7	16	11	14	13	2	93
Advanced 1 year	3	2	6	8	7	5	9	2	....	....	42
Advanced 2 years	....	1	....	....	....	1	....	....	....	....	2
Retarded 1 year	4	4	4	6	3	1	2	9	5	5	43
Retarded 2 years	....	1	....	1	1	....	....	3	2	4	12
Total	10	17	23	20	18	23	22	28	20	11	192

[1] Reprinted from Public Health Bulletin No. 77, "Rural-School Children, Including Physical and Mental Status of School Children in Porter County, Ind.," by Surgs. Taliaferro Clark and George L. Collins, U. S. Public Health Service, and Asst. Surg. W. L. Treadway, U. S. Public Health Service. 1916.

[2] In this classification, "regular" signifies that the child's mental age is the same as the chronological age. Advanced and retarded are self-explanatory.

It will be observed in the above table that nearly half the children were regarded as regular, while those retarded and those advanced one year were about equal in number. Only 14 of the 192 showed a departure from the regular of more than one year.

These tests were the first of this character devised for the purpose of determining the degree of intelligence of children in terms of mental ages. By reason of their simplicity they became widely popular.

The tests have been objected to by some on the ground that they are mainly tests of the intelligence. They certainly do not aim at a systematic determination of the development of any particular mental function. They have been found, however, in an empirical way, to give results which show the general mental development of the child.

The Binet-Simon tests do not extend beyond the chronological age of 12, because, following this age period, the mental content becomes more intricate, and a small number of tests at any subsequent age would be far from accurate.

Because of the objection that Binet and Simon examined too small a number of children to establish norms, Goddard determined the norms for these tests in the case of 2,000 American school children. His results in the case of 1,532 children are given in the following table:

TABLE XII.—*Mental and chronological ages of 1,532 American school children examined by Goddard.*

Chronological age.	Mental age.												
	2	3	4	5	6	7	8	9	10	11	12	13	Total.
4	....	1	2	2	3	....	....	....	....	....	....	....	8
5	2	4	8	40	40	16	4	....	....	....	....	....	114
6	1	....	3	29	48	69	9	....	1	....	....	....	160
7	....	1	2	8	15	14	50	4	3	....	....	....	197
8	....	....	2	2	1	87	86	16	12	3	....	....	209
9	....	....	....	....	....	27	54	56	58	4	2	....	201
10	....	....	....	....	....	15	24	19	124	27	8	2	219
11	....	....	....	....	....	4	13	25	50	60	12	1	165
12	....	....	....	....	....	4	10	13	42	36	39	7	151
13	....	....	....	....	....	1	5	6	30	19	21	3	85
14	....	....	....	....	....	....	1	1	6	5	4	....	17
15	....	....	....	....	....	....	....	3	....	1	2	....	6
Total	3	6	17	81	107	337	256	143	326	155	88	13	1,532

It will be observed in the above table that up to the age of 9 nearly all of the children of each age group graded either regular, one year advanced or one year retarded. In the succeeding age groups nearly all of them graded either regular, one year advanced or two years retarded, with the exception of the 10-year-age group, in which nearly as many children graded three years retarded as were retarded only one year.

METHOD OF EXAMINATION AND GRADING.

Goddard's revision of the Binet-Simon scale, with the addition of his 15-year old and adult test groups, was used in this survey. In one-room schools the children were examined in the classroom, in schools of more than one room, in a room where physical examinations were being made. In other words, the examination was not made in a quiet place, but in one that represented in part the child's daily schoolroom environment.

The following method of grading was employed: The child was given a basal mental age corresponding to the age group in which he successfully passed all the tests, and to this one year was added for each five tests passed successfully in the higher age groups. For example, if in addition to all the 8-year tests he also passed 3 in the 9-year group and 2 in the 10-year group, he was graded as having a mental age of 9 years.

In the case of the 12-year-old group, however, in view of the inability of a large number of 12-year-old children to repeat a sentence of 24 syllables, a child successfully passing all five of these tests and one of the 15-year group was classed as 13 mentally.

Children were classed as 15 years old mentally when they passed all of the 15-year-old tests, but less than half of the adult tests, and as adults when they passed 75 per cent of the adult tests.

Statistical results of the application of the Binet-Simon tests to 2,185 rural school children of Porter County in the first to eighth grades, inclusive, are given in the following table:[1]

RESULTS OF MENTAL EXAMINATION.

TABLE XIII.—*Chronological and mental ages of 2,185 children attending the rural schools of Porter County, Ind., in terms of per cent.*

Chronological age.	Mental age in terms of per cent of the total in each age group.												
	4	5	6	7	8	9	10	11	12	13	15	A.	Total examined.
5	.....	**23+**	42.25	23+	11.5+	.....	.....	.....	.....	.....	.....	.....	26
6	2.8	18.7	**27+**	33.7	16.8	.....	0.93	.....	.....	.....	.....	.....	107
7	.43	5.6	23.7	**37.9**	25.8	5.2	8.6	.....	0.43	.....	.....	.....	232
8	.42	1.7	6.0	12	**44.5**	18.8	6.4	2.1	.....	.....	.....	.....	234
9	.92	.92	3.7	6.5	29.1	**31.4**	22.7	4.1	.46	.....	.....	.....	216
10	.....	.36	.72	2.5	16.3	23.7	**40.7**	12.9	2.5	0.36	.....	.....	278
11	.....	.....	.....	1.8	6.6	9.9	35.3	**35.3**	8.9	1.8	.....	.....	212
12	.....	.....	.....	.....	2.6	10.3	21.0	37.8	**22.2**	5.7	0.82	.....	243
13	.....	.....	.....	.4	2.4	5.6	19.5	35.8	20.1	**13.6**	2.8	.....	249
14	.....	.....	.....	.55	.55	4.9	7.7	28.7	24.3	21.5	11.6	.....	181
15	.....	.....	.....	.....	2.9	11.7	8.8	14.7	13.4	19+	**28+**	1.4	136
16	.....	.....	.....	.....	.....	7+	10.5+	15.8+	22.8+	14+	28+	1.7+	57
17	.....	.....	.....	.....	9+	9+	9.0+	18.2	18.2	9+	18.2	9+	11
18	.....	.....	.....	.....	.....	.....	.....	50	50	.....	.....	.....	2
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	100	.....	.....	1
Total	7	46	119	204	324	280	387	390	210	128	86	4	2,185

[1] In this tabulation a child was recorded as having the chronological age of his nearest birthday and likewise as having the nearest mental age (when grading mentally in fractions of a year).

Limits of Normality.

A glance at the foregoing tables of Binet-Simon and Goddard will show that large numbers of normal children, chronologically 6, 7, 8, and 9 years of age, graded either regular, one year advanced, or one year retarded. In the case of children 10, 11, and 12 years old, chronologically, large numbers graded either regular, one year advanced, or one or two years retarded.

In the case of 13-year-old children, however, those retarded as much as three years are regarded as normal, because nearly all of the children of the series come within these limits. Thirteen-year-old children who grade 15, however, must be regarded as "exceptional children." The 14, 15, and 16 year old children graded largely within the limits of 11 and 15 years mentally and those of 17 to 20 years of age from 12 to adult.

Classification of Retarded and Exceptionally Retarded Children.

The mental progress of a child is rapid for the first few years of its life but becomes slower as maturity is approached. There is, as yet, no means of measuring this rate of progress. The difference in the mental development of a normal 2-year-old child and one 3 years old is readily recognized. This difference becomes difficult to note between the ages of 6 and 7, and between 11 and 12 years of age the recognition of mental difference by ordinary observation is quite impossible.

Mental development during any one-year period does not represent accurately a unit of mental growth, because the older the child the less rapid is the rate of mental development and the less noticeable is the retardation in any one year age period.

Moreover, retardation in very young children presents two possibilities. In the first place, owing to the greater number of years intervening before maturity, these children eventually may attain normal mental development. On the other hand, retardation may accumulate and become increasingly evident with advancing age. In consequence, the ultimate mental development of young children thus classified can not be foretold.

The problem is not so complex, however, in the case of adults or individuals who have reached a chronological age at which the rate of mental development is slower. Retardation below a certain point can not be overcome in the short time intervening before maturity at the slower rate of development, and the mental status in these cases may be determined with certainty.

The classification used in this report is based on the above considerations and children are recorded as retarded and exceptionally retarded. With the former the possibility remains of ultimate nor-

mal mental development, while with the latter the mental development will never be greater than that of a child when adult age is reached.

A graphic representation of the classification employed in these studies is shown in chart 10. Reference to it will show that children of 6 years who were 4 mentally, of 7 who were 5, of 8 who were 5 or 6, of 9 who were 6 or 7, of 10 who were 6 or 7, of 11 who were 7 or 8, of 12 or 13 who were 8 or 9, of 14 or 15 who were 9 or 10, of 16 who were 10, of 17 to 20 who were 11, are classified as exceptionally retarded.

The method of classification used is considered conservative. Although this classification may not include all the mental defectives in a school population, because of the inability to determine positively subnormality in the very young children of the lower grades, and who must, therefore, be regarded as retarded only, still the method is more reliable than the arbitrary grading of children as defectives who are retarded as much as three years. The adoption of the latter procedure would have recorded a percentage of feeblemindedness for this county far in excess of actual conditions.

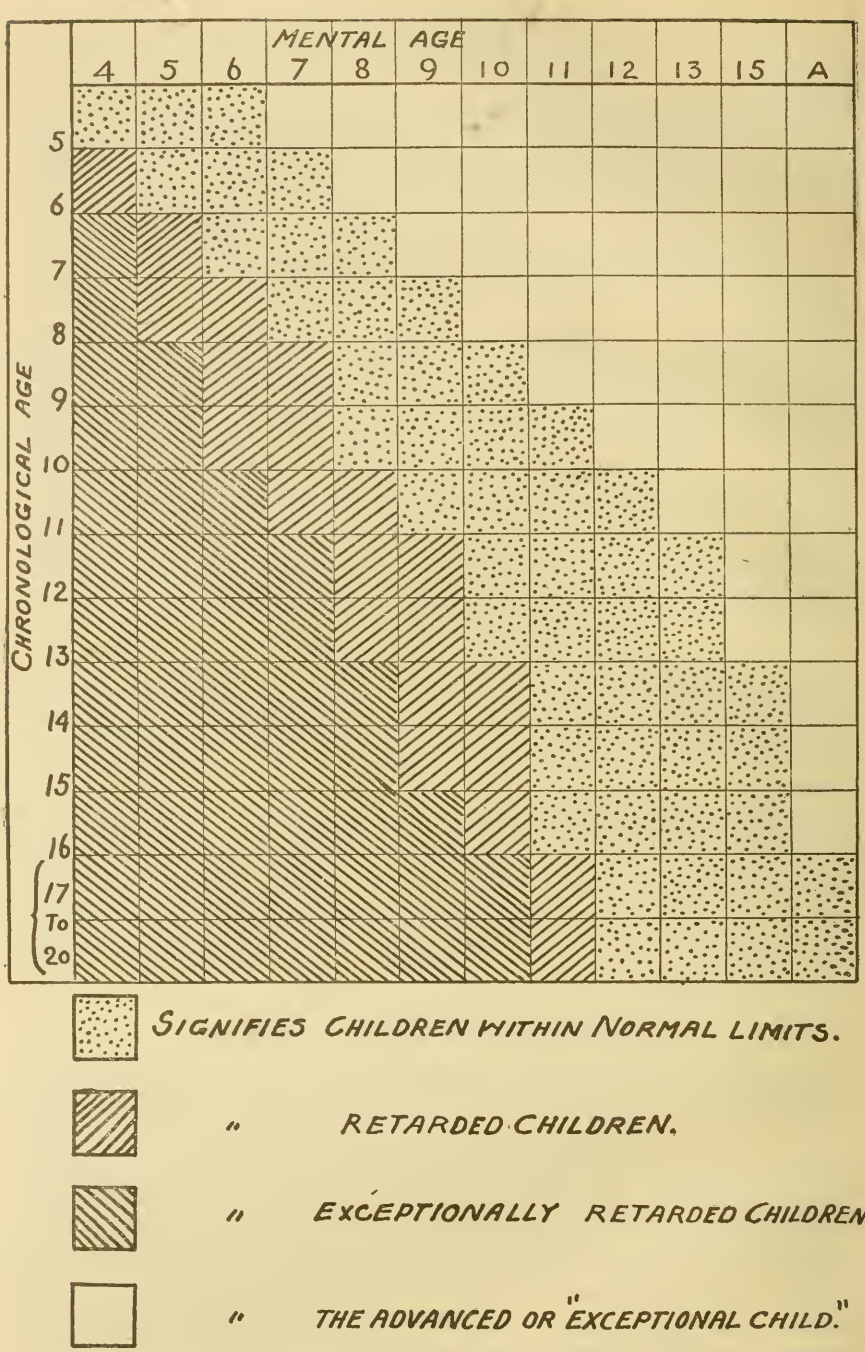
RETARDED CHILDREN.

Retarded children are to be found in every large school system. It has been stated that 50 in every 1,000 public-school children have difficulty in keeping up with their work and are in need of individual assistance.

Of the 1,087 girls and 1,098 boys examined in the rural schools of Porter County, 93 of the former and 100 of the latter were retarded, and, excluding the exceptionally retarded children, constituted 8.7 per cent of the number examined. Including the exceptionally retarded children, the whole number of children requiring special attention was 214, or 9.3 per cent.

Defects Associated With Retardation.

The delicate physical and mental adjustments of children are much more easily upset than is the case with adults. Minor physical defects, which ordinarily make no impression upon a grown person, may prevent the normal physical and mental growth of the child. Defects of vision and hearing, defective teeth, adenoids, enlarged tonsils, nutritional disturbances, and certain general diseases react injuriously on both the physical and mental development of the child. It becomes important, therefore, to consider the hampering effects of physical defects and diseases in connection with mental retardation, and to take steps for their correction when possible.



Normal mental age limits for one-year chronological age periods, and limits for advanced, retarded, and exceptionally retarded children, measured by Binet-Simon scale.

Thirty-five per cent of the 93 retarded girls found in the rural schools of Porter County were undersized, 41.1 per cent were of normal size, and 23.5 per cent were above the county average in height and weight. Furthermore, 58.8 per cent had defective eyesight, 26.4 per cent had defective hearing, 1.7 per cent had adenoids associated with enlarged tonsils, 2.9 per cent had enlarged tonsils without adenoids, and 17.6 per cent had defective teeth.

Thirty-eight per cent of the 100 retarded boys were undersized, 30 per cent were of normal stature, and 32 per cent were above the county average of height and weight. In addition, 47 per cent had defective eyesight, 19 per cent had confused color discrimination, 34 per cent had defective hearing, 6 per cent had adenoids and enlarged tonsils, 17 per cent had defective teeth, and one child had a cleft palate.

Two or more physical defects were frequently associated in the same child.

Other Causes of Mental Retardation.

Improper teaching methods are responsible for much of the retardation found in schools. The teachers of the public schools of the country have imposed upon them a great responsibility, no small part of which is the molding of character. Education is something more than imparting instruction. Young people who adopt teaching as a temporary avocation do not meet with the same success in training children as do those who make this profession a life work. The training of teachers, therefore, and their selection, warrant the most careful consideration, because, in addition to technical training, the successful teacher must be adaptable and have the ability to broaden the outlook upon life of certain types of introspective children.

Poorly equipped school buildings, defective illumination, faulty ventilation and heating, uncomfortable seats, and unattractive surroundings operate to cause retardation. The discomfort experienced in buildings of this type produces a hampering effect on the mental concentration necessary for educational purposes. The provision of school buildings erected in accordance with modern sanitary principles will do much to reduce the amount of retardation appearing in school children.

In a number of instances children have been advanced in grade without proper preparation. A child who has failed to acquire the fundamentals in a lower grade can not properly do the work in the higher classes, and, when unduly promoted, suffers injurious retardation. Children of this type frequently quit school with a poor educational equipment.

In Porter County the average loss of grade by retarded children, as recorded by teachers, was 1.28 years for girls and 1.5 years for boys.

Mental retardation is most frequently met with in crowded one-room schools where several grades are taught by one teacher. A number of schools of this type are in operation in Porter County. Where the number of pupils in attendance is large, the time of the teacher is too occupied by routine duties to permit of individual instruction of children who find difficulty in mastering the fundamentals of education.

Care of Retarded Children.

Children who are unable to advance in school work by methods which are effective in regular classes require special educational facilities, which are of practical attainment through the organization of special classes. The organization of such classes rarely can be accomplished in districts where there are principally one-room schools by reason of the increased cost. The consolidation of rural schools, however, offers facilities for special classes and individual instruction to larger groups of children who would otherwise remain misfits in the smaller schools.

Wherever such classes are organized the retarded children should not be segregated in the most undesirable room in the building. Moreover, the teachers should have special qualifications for this kind of instruction and not be selected because of years of experience in other branches of pedagogy. They should have training in the management of children, a knowledge of the methods employed in correcting speech defects, and a fair understanding of some of the problems of psychology as related to the child and of the principles of physiology.

The value of special classes for retarded children is shown by the fact that 50 per cent of the children who are placed in such classes rejoin their proper grade when faulty methods are corrected and physical conditions improved.

EXCEPTIONALLY RETARDED CHILDREN.

Of the 1,087 girls and 1,098 boys examined in the rural schools of Porter County 7, or 0.6 per cent, of the former and 14, or 1.2 per cent, of the latter were so exceptionally retarded that their mental development at no time will be greater than that of a child.

Defects Associated With Exceptional Retardation.

Twenty-eight per cent of the exceptionally retarded girls were undersized and 57 per cent were above the average physical development of the county, as compared with only 23.5 per cent of the girls who were simply retarded. Furthermore, 42.8 per cent had defective eyesight, 14.2 per cent had defective hearing, and 2.9 per cent had enlarged tonsils.

Of the exceptionally retarded boys, 28.5 per cent were undersized, 28.5 per cent were of normal physical development, and 42.8 per cent were above the average for the county in height and weight. In addition, 34.2 per cent had defective eyesight, 57.1 per cent had defective hearing, and 7.1 per cent had enlarged tonsils.

Among the exceptionally retarded children the average loss of grade, as recorded by teachers, was 2.1 years for girls and 2.5 years for boys.

The number of exceptionally retarded children consituted 0.9 per cent of the total number examined. This does not include all of the defectives among children of school age in the county. It must be assumed that some children, by reason of grave mental defects, were unable to attend school.

Characteristics of Exceptional Retardation.

Mental deficiency, or feeble-mindedness, as it is more often termed, has been defined as a lack of normal mental development. Individuals of this class can be educated to a degree, but with them mental progress is so decidedly slow that their mental capacity is no greater than that of a child, even when adult life is reached. Persons whose intelligence is developed to so slight a degree are misfits in a society arranged for people whose mental development continues until the retrogressive changes of old age begin. They become dependents because of their inability to compete with persons of higher intelligence, immoral because unable to adjust their sexual problems to moral laws, and delinquent because they do not understand the significance of laws devised for the protection of society.

Causes of Exceptional Retardation.

A defective heredity, insanity, alcoholism, and syphilis in one or both parents are considered responsible for most of the cases of mental defectives. A large part of the evidence that heredity is an important causative factor of mental deficiency is based on indirect testimony. The great value of investigations of this character is the determination of existing cases of mental deficiency as a starting point for future studies of the influences of heredity on succeeding generations.

Of the other causes of mental deficiency may be mentioned congenital defects, injuries, and nutritional disturbances. Improvement by better sanitation of the health of communities will be followed also by a reduction in the number of mental defectives.

Number of Exceptionally Retarded Children.

According to the United States census report, 1910, 20,000 mental defectives were in special institutions in this country. Mental examinations of a large number of persons in prisons, penitentiaries, jails,

and workhouses during the last few years show at least a third of the number examined to be mentally defective. At this rate not less than 40,000 of the 136,472 persons in such institutions, including those for juvenile delinquents, in 1910 were mental defectives.

It has been estimated that 20 in each 1,000 American school children are mental defectives,[1] and that 2 in 1,000 of the general population are mental defectives. On the basis of the lowest figures it is estimated there are at least 200,000 feeble-minded persons in the United States. As a conservative estimate, about 130,000 feeble-minded persons are without institutional care of any description. Only 26 States have provided institutions for the feeble-minded

Care of Mental Defectives in Indiana.

In 1879, a department for feeble-minded children was established as an adjunct to the Soldiers' and Sailors' Orphans' Home at Knightstown, Ind. The legislature, by an act approved March 7, 1887, gave the institution an independent existence and changed the name to Indiana School for Feeble-Minded Youth. A new institution was built at Fort Wayne. It was not occupied, however, until July 8, 1890.

The privileges of the school are extended to feeble-minded, idiotic, epileptic, and paralytic children under 16 years of age. Since 1901 the school has maintained a custodial department for feeble-minded women between the ages of 16 and 45 years. These women are committed by the courts (Laws, 1887, p. 47; 1901, p. 156). A colony farm containing 509⅓ acres has been in operation since 1893.

The superintendents of the various almshouses in Indiana, in 1914, reported 489 feeble-minded men and 380 feeble-minded women in the various almshouses of the State. Of the 380 feeble-minded women, 118 were within the child-bearing age period. Of the 3,228 almshouse inmates, 1,389, or 43 per cent, were insane, feeble-minded, or epileptic.[2]

Education of Feeble-Minded.

The aim of the education of feeble-minded children should be to train them to be self-supporting. Intellectual training, in its narrower sense, is of secondary importance.

Most American institutions for the feeble-minded are broadly divided into two departments—educational and custodial. The education of the feeble-minded, compared to that for normal children, differs in degree only and begins at a lower plane. Satisfactory gradations or classifications are made so that children with irregular and unusual deficiencies receive individual training in special classes.

[1] The number of mental defectives found in this survey was not greater than 9 in 1,000.

[2] Twenty-fifth Annual Report of the Board of Charities of Indiana, September, 1914.

The most prominent feature of the education of the feeble-minded, however, is their training in industrial occupations and manual labor, as now successfully and profitably carried on by the pupils in these schools. Through correct training of this character a certain number of these individuals lead useful lives after leaving the institutions. About one-half the higher grades of mental defectives who have been under training from childhood are self-supporting, under intelligent supervision, whether in an institution or at home. It is especially important to begin training of this character early in the child's life.

Mental Deficiency and its Relation to the Community.

Recent investigations of the defective and delinquent classes have demonstrated that a large percentage of criminals, paupers, tramps, and prostitutes are really congenital imbeciles who have been allowed to grow up without training or discipline. Society suffers the penalty of such neglect through an increase in pauperism, vice, and crime, and the greatly increased cost of the care of adult feeble-minded persons.

Feeble-minded girls, exposed to evil influences, are unable to protect themselves from the perils peculiar to women. There is hardly a poorhouse in this country which has not one or more feeble-minded women who are mothers of several illegitimate children. It is often the case, in rural communities, that a girl of this type, when illegitimately pregnant, has no place to go except to the almshouse. After the community has borne the expense of three or four confinements, she is finally committed to an institution for the feeble-minded. From every consideration of morality, humanity, and public policy, feeble-minded women should be under permanent and watchful guardianship, especially during the child-bearing age.

OTHER MENTAL CONDITIONS WHICH REQUIRE SUPERVISION.

Epileptics.

During the course of this survey three epileptic children were observed. One of these was feeble-minded.

The State of Indiana has provided an institution for cases of this type, which is located near New Castle. All epileptics having a legal settlement in the State are admissible.

Recent studies of juvenile offenders show that a fair per cent of them are afflicted with epilepsy. It is estimated that every juvenile epileptic offender, because of his constitutional tendency to corrupt others, in the end will cost the State the sum of $6,000. It is important, therefore, for communities to realize that, because mental conditions play no small part in the production of crime, early recognition of these cases and suitable provisions for their supervision and training will obviate future expense.

Juvenile Delinquent.

In every community there are a number of children who are morally irresponsible. They show no marked deficiency of the intellectual faculties, but early in childhood manifest a perversion of the moral sense, which is shown by motiveless, persistent lying and thieving, an impulse to arson and cruelty to animals and to younger or helpless companions. These constitutionally inferior persons comprise a large percentage of habitual criminals. The presence of one or more children of this type in school exercises a pernicious influence that is usually associated with an increase in the number of children who fail to make grade. It is undesirable to permit children of this type to attend school. It is still more undesirable to turn them loose on the community without restraint, because they are potential criminals in a poor environment. It is incumbent on the State, therefore, to care for such children and give them suitable training.

During the course of this survey two marked cases of this type of mentality were found.

State provision for juvenile offenders.—The State of Indiana has established two schools for the correction and reformation of juvenile offenders. That for boys is established on a farm near Plainfield and receives boys committed for crime from 8 to 16 years of age. In the case of incorrigibility, however, the commitment age is from 10 to 17. The term of commitment continues until the boy is 21 years of age. One-half of the cost of caring for each boy is paid by the county from which he is committed.

The daily average attendance is near 600 boys.

The Indiana girls' school is situated on a farm near Clermont. The age of commitment for girls is from 10 to 18 years of age. The term of commitment is until 21 years of age.

The daily average attendance is a little over 300.

In Indiana the judge of the circuit court is the guardian of all children who need State protection. In addition, the State has formed a board of children's guardians, which is composed of six members, three of whom are required to be women. Each member must be a parent.

The practice of committing juvenile offenders without an attempt to determine their mental status is not a good one. The possibility of a miscarriage of justice by this procedure is very great. It is desirable that courts which deal with children should have attached to them a competent psychologist to determine the children's mental status. Furthermore, the combination of these duties with that of the mental inspection of school children would be practicable. A psychologist attached to the courts could bring about the proper segregation of the feeble-minded in places other than the county almshouse, which is so unsuitable for the purpose.

SUMMARY.

Children were classified as normal, retarded, and exceptionally retarded, the latter comprising all children with mental deficiency.

The Binet-Simon tests were used in this survey to show the general mental development of the children examined. In the case of the exceptionally retarded children, however, special methods were employed to determine the mental status of each child so recorded.

Of the 1,087 girls and 1,098 boys examined in the rural schools, 93 of the former and 100 of the latter were below the average mentally, or 8.7 per cent of the whole number. The total number needing specialized instruction was 214, or 9.3 per cent.

Seven girls, or 0.6 per cent, were retarded in such degree that their mental development at adult life would not be greater than that of children. Of these, 28 per cent were below the mean physical development for the county.

Of the boys, 1.2 per cent were exceptionally retarded. Of these, 28.5 per cent were below the mean physical development of the county as a whole. Of the total school population, 0.9 per cent were mental defectives. The percentage of exceptionally retarded children recorded in the county is considerably less than that found by other observers in other localities.

Of the physical defects associated with retardation, those of the special senses, with the exception of defective hearing, were found in greater proportionate numbers among children who were simply retarded. The exceptionally retarded children were above the average stature of the county in greater proportionate numbers than retarded children.

The undue number of one-room rural schools in the county which were of faulty construction, with poor equipment, and with imperfect teaching facilities, were largely responsible for the retardation found in the county.

The average loss of grade by 193 children, as recorded by teachers, was 1.28 years for girls and 1.5 years for boys, a total of 269 school years.

No special classes for the instruction of retarded children were found in any of the rural schools of the county.

In addition to the 214 children who were retarded and exceptionally retarded, 3 epileptics and two constitutionally inferior children were found among the school children of the county.

CONCLUSION.

The undue number of mentally defective and retarded school children revealed by these examinations emphasizes the necessity of the mental classification of the children of the county for the purpose of revealing those who are in need of institutional or individualized treatment.

RECOMMENDATIONS.[1]

(10) The duties of medical inspector of schools should be combined with those of local health officer.

(11) A full-time officer should be required to be appointed for the discharge of these combined duties, thereby preventing the spread of disease in the school and improving health conditions in the county.

(12) It would be desirable for the above-mentioned officer to be affiliated also with the juvenile courts or other courts having jurisdiction over juvenile delinquents to make mental examinations of such offenders for the purpose of mental classification in the interest of justice.

(13) Steps should be taken to secure institutional treatment for the mental defectives in the county.

(14) Measures should be taken to secure special classes and individualized instruction for children who are simply retarded and fail to make grade.

[1] Recommendations 1 to 9 refer to sanitary condition of schools and physical status of school children.

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